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Grass roots of occupational change: Understanding mobility in vocational careers☆

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ABSTRACT

Most prior research on career mobility has focused on people changing jobs and organizations. We know little about processes involved in individuals changing occupations, although these changes cause high individual, organizational, and public costs. Moreover, occupations are increasingly acknowledged as important anchors in times of more boundaryless careers. The current study investigates the impact of early satisfaction with the trained occupation (VET satisfaction) on occupational change by analyzing 10-year longitudinal panel data gathered in Switzerland (N = 905). Results from regression analyses showed that VET satisfaction predicted occupational change up to ten years after graduation. VET satisfaction in turn was affected by work characteristics experienced during VET, and VET satisfaction mediated the relationship between work characteristics during VET and occupational change. Using a subsample (N = 464) for which data were available on jobs taken up after graduation, we showed that VET satisfaction explained occupational change over and above work satisfaction in jobs held after graduation, highlighting the formative role of early experience during VET. Our findings inform both theory and practice. To fully comprehend occupational change, established turnover models also need to reflect on early formative vocational experiences. Firms should pay attention to favorable work characteristics already during VET and adjust adverse conditions to reduce undesired occupational mobility.

1. Introduction

Career mobility has become a rather common phenomenon and is considered a normal aspect of today's careers (Ahn et al., 2017; Carless & Arnup, 2011). Most of the respective literature discusses mobility across jobs and organizational boundaries (Rodrigues & Guest, 2010), while mobility between different occupations has rarely been addressed. Given the growing appreciation for occupations as important points of orientation in career trajectories, more knowledge on the processes involved in occupational mobility is needed (Anteby et al., 2016; Carless & Arnup, 2011). Because "occupations are institutionally defined and regulated bundles of qualifications" (Grunow & Mayer, 2007, p. 3), the change to a new occupation represents a major transition in career paths (Feldman & Ng, 2007). Such transitions or changes require individuals to learn fundamentally new knowledge and skills that need to be gained through additional training, education, or vocational preparation (Feldman, 2002). Formal education, such as vocational education

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and training (VET), signifies high human capital investment (Becker, 1962), which is at least partially lost when leaving one occupational domain in favor of another (Kambourov & Manovskii, 2008). Hence, occupational mobility usually comes with high costs in terms of invested time and money (Blau, 2007). These costs affect not only organizations and individuals, but also the broader society in terms of public investments in educational systems (Becker, 1962; Brett, 1980).

Human capital loss is not only problematic for occupations that require university education, but also and especially in the context of VET, where occupation-specific human capital is carefully built during several years of apprenticeship (Eggenberger et al., 2018). The apprenticeship model underlying VET has recently gained traction in an increasing number of countries and for an increasing number of occupations (Smith & Kemmis, 2013; World Bank, 2019). Fuller and Sigelman (2017), for instance, demonstrated the broad unrealized potential apprenticeship programs hold for many occupations in the U.S. economy. Thus, with growing interest in apprenticeship systems, it is timely to investigate the antecedents of occupational change specifically for VET occupations.

To date, there is little research on explaining occupational change (Carless & Arnup, 2011). Some prior research has focused on work-related predictors of mobility, such as job resources (De Cuyper et al., 2011), while other studies have discussed personal attributes or traits (e.g. Coder, 2007). Moreover, concepts like occupational embeddedness and boundarylessness (Howes & Goodman-Delahunty, 2015) as well as occupational commitment, uncertainty tolerance, and work satisfaction (Otto et al., 2010) have been introduced as antecedents of career mobility. Specifically work satisfaction, that is the positive evaluation of the current situation at work (Otto et al., 2010), has been shown to impact employees willingness to change their occupations (Blau, 2000), and is considered a consistent predictor of job turnover (Rubenstein et al., 2018). However, whether specific work characteristics that precede work satisfaction impact the probability of changing one's occupation, has not yet been considered. This is astonishing as research on work design has provided ample evidence for the fundamental influence of work characteristics on work satisfaction, turnover, individuals' self-concepts, and occupational identities (Hackman & Oldham, 1976; Humphrey et al., 2007; Oyserman, 2001; Parker, 2014).

“Work design matters” (Parker, Morgeson, & Johns, 2017, p. 404), as it is a key antecedent of many highly relevant dependent variables in the field of psychology, including work satisfaction, well-being, absenteeism and employee performance. Thus, because of the fundamental role work design plays in causing positive outcomes and mitigating negative ones for individuals and organizations likewise (Parker, 2014), it is most likely also important for understanding occupational change. Still, to the best of our knowledge, it has been neglected as a focal predictor of occupational change in prior studies. Learning which work characteristics contribute to people leaving the occupation they were initially trained in, and potentially accept a major loss of prior human capital investment, is therefore a critical endeavor in career mobility research.

Heeding calls to identify mechanisms involved in actual—not just intended—occupational change (Carless & Arnup, 2011; Dlouhy & Biemann, 2018), this study investigates the influence of work characteristics experienced during the years of VET, and satisfaction with the occupation trained in (VET satisfaction) on occupational change. Additionally, the relevance of the VET experience for occupational change is compared to work characteristics and work satisfaction in later employment. The contributions of our study are threefold: First, we connect work design and career research to identify factors contributing to occupational change as an increasingly relevant but understudied form of career mobility. Second, we highlight the role of individuals' VET satisfaction as a predictor of occupational change over and above later work experiences. Third, the paper addresses prior methodological shortcomings in testing a longitudinal mediation model based on panel data with actual occupational change, not turnover intentions, as outcome variable. Understanding antecedents of occupational change anchored in early work experience during VET enriches current models of career mobility and instructs practitioners on how undesired mobility can be reduced.

2. Occupational change in vocational careers

Occupations are characterized by specific sets of work role requirements which define the tasks to be performed, and the knowledge and skills needed to accomplish these tasks (Dierdorff et al., 2009). The rules for access to and performance within occupations are well-defined, especially for VET occupations (Grunow & Mayer, 2007). Changing the occupation implies entering a different work environment where novel skills and routines need to be acquired. In contrast, changing jobs refers to intra- or inter-organizational mobility, usually within the same occupation (Ng et al., 2007). Because human capital is often specific to the occupation in which the individual works (Kambourov & Manovskii, 2008, 2009), changing the occupation is usually costlier and less common than changing jobs while remaining in the same occupation (Longhi & Brynin, 2010; Robinson, 2018; Sullivan, 2010). Occupational mobility, or occupational change, is consequently considered a rather extreme process (Meyer et al., 1993).

To date, research on work-related predictors of actual, not intended, occupational change is very rare (Blau, 2000; Darvin, 2020). Prior research has investigated work satisfaction, job security, openness to experience, and salary as antecedents of occupational change (Carless & Arnup, 2011; Kornblum et al., 2018). Many other studies have used the intention to change occupations as a proxy for actual change, and introduced constructs like occupational commitment and embeddedness, work satisfaction, burnout, or boundarylessness as predictors (Howes & Goodman-Delahunty, 2015; Otto et al., 2010; Van Der Heijden et al., 2019). Yet, learning from the job change literature, the relationship between turnover intentions and actual change is modest (Griffeth et al., 2000), and the two should not be treated as the same (Rubenstein et al., 2018). Additionally, the few existing studies examining actual change are limited to a small set of specific occupations, like nurses (Kramer & Son, 2016), providing an incomplete understanding of work-related predictors of occupational change. In our study, we follow the call to assess actual occupational change (Carless & Arnup, 2011; Dlouhy & Biemann, 2018) by analyzing the impact of work design on occupational change for a broad range of occupations.

In the current study, we investigate the importance of work characteristics experienced during VET for apprentices' satisfaction with their training occupation (VET satisfaction). More specifically, we use the work characteristics job variety, autonomy, strain, and

perceived opportunities for career development as predictors for VET satisfaction. VET satisfaction is in turn used to predict occupational change up to ten years after graduating from VET. Finally, we test a mediation model, in which VET satisfaction mediates the relation between VET work characteristics and occupational change. In a second step, we include the same work characteristics and job satisfaction from later employment as more proximal predictors of occupational change to examine the relative impact of the early formative experience during VET. Considering the early impact of work design during VET, VET satisfaction, as well as experiences in later employment on occupational mobility allows for a better understanding of vocational career trajectories.

2.1. The importance of work characteristics

In the many years of work design research, work characteristics have been linked to numerous meaningful outcomes on the individual, team, and organizational level, as recent meta-analyses demonstrate (Humphrey et al., 2007; Parker, Morgeson, et al., 2017). Work design, defined as "the content and organization of one's work tasks, activities, relationships, and responsibilities" (Parker, 2014, p. 662), is related to positive outcomes like job satisfaction, work motivation, and performance (Humphrey et al., 2007). When considering outcomes of work design, it is also important to direct attention to the occupational context which provides opportunities and boundaries of different work design features (Dierdorff & Morgeson, 2013). For instance, while some occupations generally allow for more autonomy (e.g. project manager), others are by definition more physically strenuous (e.g. construction worker). Changing the occupation can consequently lead to a sharp disruption in the experienced work characteristics as the central task characteristics change as well (Zhou et al., 2017). As there is strong evidence for the positive relationship between work characteristics and work satisfaction (Dierdorff & Morgeson, 2013; Morgeson & Humphrey, 2006; Parker, 2014), we propose that this relationship also holds true when investigating the link between work characteristics experienced during VET and satisfaction with the VET occupation (VET satisfaction). Leaning on work design research (Kulik et al., 1987), we assume that a positive evaluation of occupation-specific work characteristics results from a fit between the apprentice and their occupational environment. The on-the-job learning experienced throughout the first formative period of VET can substantially influence young adults' further career development (Frese, 1982; Worthen & Berchman, 2010). Hence, the occupational environment and the experienced work characteristics do not only affect the current work satisfaction but can also form apprentices' occupational identity over time (Ibarra, 2006; Ibarra & Barbulescu, 2010). We thus expect work characteristics experienced during the formative period of VET to shape the apprentices' evaluation of the occupation itself as they provide a realistic view on career prospects within the training occupation. Therefore, we assume that work characteristics experienced during VET also impact VET satisfaction, that is, the satisfaction with the trained occupation.

To study the postulated relationship, we focus on the following four fundamental characteristics of work: job variety, autonomy, strain, and opportunities for career development. Hackman and Oldham (1976) describe both job variety and autonomy in their seminal job characteristics model. The model assumes that specific job characteristics lead to positive psychological states, which in turn lead to work satisfaction (Judge et al., 2000). Job variety relates to the degree to which different skills are required to conduct one's work (Hackman & Oldham, 1976). It is positively related to work motivation and satisfaction, and negatively related to burnout (Humphrey et al., 2007). Autonomy refers to the employees' freedom to make self-directed decisions about work (Hackman & Oldham, 1976). It is positively related to work satisfaction, and negatively related to intention to quit (Spector & Jex, 1991). Strain is defined as "aversive and potentially harmful psychological reactions of the individual to stressful work" (de Croon et al., 2004, p. 443). Strain results from a demanding work environment, where job demands such as time pressure are high, and decision latitude is low and hence the individuals' adaptive capability is exceeded (Bakker et al., 2003; Karasek, 1979). Numerous studies have demonstrated that strain negatively predicts work satisfaction (Van der Doef & Maes, 1999). Finally, opportunities for career development refer to the possibilities for further development and further education that are offered to employees (Prümper et al., 1995). Employers are perceived as more attractive and employees are less likely to leave their occupations when opportunities for learning and growth are provided (Van Der Heijden, 2003; Van der Heijden et al., 2009).

In the current study, the task-related work characteristics job variety and autonomy are selected as they refer to evaluations of the occupational tasks themselves and have been among the most commonly investigated aspects of work design (Morgeson & Humphrey, 2006). Additionally, strain is selected as a frequently used measure of qualitative and quantitative work demands in the work design literature (Parker, Van den Broeck, & Holman, 2017). Finally, we include opportunities for career development as these are directly related to personal growth and career building, which is generally valued by young adults and implies important information for apprentices' future career development (Carstensen, 1992).

Hypothesis 1a. Work characteristics experienced during VET, specifically job variety, autonomy, strain, and opportunities for career development, are positively related to VET satisfaction, measured at the end of VET.

2.2. Predictive validity of work satisfaction

There is a long tradition of research on the fundamental role of job or work satisfaction in explaining turnover. According to Lent and Brown (2006), the terms job satisfaction and work satisfaction can be used interchangeably. Throughout this paper, we use the term work satisfaction. Early models on career change already discuss how dissatisfaction evolves into turnover, and why people quit their jobs or occupations (Dawis & Lofquist, 1984; Mobley et al., 1979; Rhodes & Doering, 1983). Multiple antecedents impact the evaluation of one's work satisfaction, including organizational and personal factors, the perceived availability of alternatives, and the perceived correspondence or fit between a person and their work environment. If an individuals' needs and skills fit the requirements

of the work environment, satisfaction (or correspondence) is achieved; if this fit is not established, dissatisfaction evolves. One possible response to dissatisfaction caused by misfit is the movement to a new work environment, whereby the previously unsatisfactory situation is actively adjusted (Dawis, 2002). The strong predictive validity of work satisfaction for turnover, and of the work characteristics underlying work satisfaction, has been confirmed in several comprehensive meta-analyses (Griffeth et al., 2000; Rubenstein et al., 2018). Apart from other causes, higher age and tenure, high overall work satisfaction, and a positive evaluation of work characteristics emerge consistently as negative predictors of turnover (Mobley et al., 1979; Rubenstein et al., 2018). Still, most of the established literature targets the change of jobs or organizations, and not occupational change (Blau, 2007; Van der Heijden et al., 2009). Recently, Otto et al. (2010) demonstrated that work satisfaction is negatively related to the intention to change occupations, just as hypothesized in the early career change models. While research found that satisfaction with one's occupation predicts occupational turnover intention (Li et al., 2019), research linking work satisfaction to actual occupational change is still scarce (Carless & Arnup, 2011).

Because individuals are less likely to leave their occupations after receiving specific training (Shniper, 2005), not only work satisfaction, but especially VET satisfaction is important to understand vocational career trajectories. VET satisfaction is not limited to the immediate job context at a specific employer, but rather relates to the broader professional context. A positive evaluation of this context is thus closely related to higher occupational commitment (Otto et al., 2010). Occupational commitment refers to the psychological link between a person and their occupation (Lee et al., 2000). Commitment can be developed through a high person-occupation fit and social integration during the years of VET, where apprentices are trained to become professionals in their respective occupations (Nägele & Neuenschwander, 2014). Committed individuals identify strongly with their occupations, report higher levels of work satisfaction, and are consequently less willing to change their occupations (Blau, 2000; Lee et al., 2000; Yousaf et al., 2015).

Cohen (2007) suggests that apprenticeship programs significantly influence the development of occupational commitment, ultimately leading to an occupational identity tied to the learned profession. While apprentices build an occupation-specific set of work role requirements and capabilities needed to perform well during VET (Dierdorff et al., 2009), the process of occupational identity development takes place (Erikson, 1968). Occupational identity development is considered as one of the most important tasks of adolescence, providing the individual with a sense of "who am I" (Skorikov & Vondracek, 1998, p. 17) in a central life domain. Apprentices thus establish their personal identity as workers during VET as they convert from adolescence to adulthood (Porfeli et al., 2011). Ultimately, occupational identity is established, when the assessment of the VET occupation is overall positive (Meyer et al., 1993), and adolescents express satisfaction with the occupation they were trained in (i.e., VET satisfaction). Because the period of VET is a formative process which involves the development of occupation-specific human capital, occupational commitment and one's occupational identity, we assume that work-related experiences gained during VET have a long-lasting impact on future career development and decisions. More specifically, we assume that the overall assessment of this experience in terms of VET satisfaction predicts occupational change within ten years after graduation.

Hypothesis 1b. VET satisfaction measured at the end of VET is negatively related to occupational change up to ten years after finishing VET.

2.3. Satisfaction as a mediator between work characteristics and occupational change

As occupations differ in the required knowledge, skills and abilities (Morgeson et al., 2010), they have different prevailing work designs (Parker, Van den Broeck, et al., 2017) and provide different opportunities for individuals to meet their needs and interests (Dierdorff & Morgeson, 2007, 2013; Morgeson et al., 2010). Being satisfied with one's occupation is an important mediating factor in predicting occupational change. This assumption has already been formulated in the model of career change by Rhodes and Doering (1983), but has remained untested in studies targeting occupational change. So far, we have argued that VET satisfaction predicts occupational mobility and that work characteristics experienced during VET are important determinants of VET satisfaction. This leads to the assumption that VET satisfaction acts as a mediator in the relationship between work characteristics experienced during VET and occupational mobility.

Hypothesis 1c. VET satisfaction measured at the end of VET mediates the relation between work characteristics experienced during VET and occupational change up to ten years after finishing VET.

2.4. The lasting impact of early formative experiences

In the current study, we aim to highlight the importance of the formative VET context (Frese, 2008) with its early exposure to occupation-specific working conditions in explaining occupational change. To examine the relevance of VET satisfaction for occupational change up to ten years after graduation, more proximal predictors, such as work satisfaction prior to change, need to be considered as well. Therefore, we included both work satisfaction and work characteristics from employment after VET in the second part of the study. Following the argumentation for Hypothesis 1, we first assume that work satisfaction is determined by work characteristics, after controlling for VET satisfaction (Hypothesis 2a). Second, we assume that VET satisfaction still has predictive power in explaining occupational change, even when the more proximal predictor of work satisfaction in employment after VET graduation is included (Hypothesis 2b). Finally, in line with Hypothesis 1c, we assume that work satisfaction mediates the relation between work characteristics and occupational change, also in regular employment after VET (Hypothesis 2c).

Hypothesis 2a. Work characteristics experienced in employment after VET, specifically job variety, autonomy, strain, and opportunities for career development, are positively related to work satisfaction in employment after VET.

Hypothesis 2b. Work satisfaction in employment after VET and VET satisfaction are both negatively related to occupational change up to ten years after finishing VET.

Hypothesis 2c. Work satisfaction in employment after VET mediates the relation between work characteristics experienced in employment after VET and occupational change up to ten years after finishing VET.

3. Method

3.1. Context of the current study

The current study investigates occupational mobility in the context of the VET system in Switzerland, which is well established for a wide range of occupations and industries (Fuller & Sigelman, 2017). For three to four years, apprentices attend vocational school and a work place in a company that provides on-the-job learning. In these two complementary learning environments, occupation-specific skills are acquired and certified (Ebner et al., 2013). Due to this strong linkage of the educational system and the labor market, the transferability of occupation-specific human capital is low (Grunow & Mayer, 2007), and occupational mobility specifically costly (Blau, 2007). Because the educational content is specified in distinct skill bundles for each occupation (Eggenberger et al., 2018), the impact of occupation-specific work design is particularly well-defined in VET-based vocational careers. VET creates a unique opportunity to get an intimate knowledge of one's future work role while acquiring occupation-specific knowledge and skills (Ebner et al., 2013).

3.2. Participants and procedure

Our sample is taken from the longitudinal panel study on Transitions from Education to Employment (TREE) in Switzerland, which uses a representative sample to follow school leavers in their post-compulsory educational pathways. The panel is based on the Swiss cohort of the Program for International Student Assessment (PISA) in 2000. The panel participants finished compulsory school in the year 2000 and were followed up with a total of nine measurement waves from 2001 to 2014. The first seven waves were conducted on an annual basis (2001–2007), wave eight was carried out in 2010, and the final wave nine in 2014. A mix of paper-and-pencil surveys, telephone interviews, and computer-assisted telephone interviewing (CATI) was used to collect the data (for details see TREE, 2016b).

We only included participants who reported VET as their first education ($n = 2593$) and provided information in the last measurement wave in 2014 ($n = 1609$), approximately ten years after finishing VET. Out of this group, our final sample consists of 902 VET graduates (50% female) who provided information on their VET satisfaction and work characteristics at the end of VET in 2003, as well as on their current occupation in 2014 (representing a response rate of 56.1%). The average age in 2003 was 17.1 years ($SD = 0.64$ years, range: 15–18 years). Participants were trained in a broad range of occupations, clustered within 48 occupational groups, including commercial employees, occupations of trade, engineering, construction industry, and the health sector.[1] In the ten years after finishing VET, 40.5% had not changed their occupation and were subsequently coded as stayers ($n = 365$, 60.3% female), whereas 59.5% had changed the occupation at least once from their initial VET occupation ($n = 537$, 43% female) and were coded as changers.

To test Hypotheses 2a, 2b, and 2c, additional information on work characteristics and work satisfaction between 2004 and 2010 was needed. This information was only provided by a subsample of 462 participants (59.7% female), since participants had missing data for some measurement waves. If a participant had changed the occupation during the observed period (e.g., change observed in wave 8), measures of work characteristics and work satisfaction were taken from the measurement wave before the change had occurred (e.g., wave 7). If no change had occurred, measures were taken from the last available wave before 2014. Accordingly, the relevant measurement waves are change-specific (CS), instead of wave-specific, and differ between participants: For 54.8% of the subsample, CS measures are taken from wave 8, for 25.3% from wave 7, for 8.2% from wave 6, for 8.7% from wave 5, and finally, for 3% from wave 4. Fig. 1 provides an overview of the samples, points of measurement, and included measures.

For the assessment of attrition bias, we entered work characteristics measured at the end of VET, gender, and occupational change assessed in 2014 in a logistic regression analysis predicting the probability of being included in the subsample (Goodman & Blum, 1996). Female respondents were more likely to belong to the subsample ($B = -0.69, p < .000, OR = 0.50$) as did participants with higher VET satisfaction ($B = 0.39, p = .003, OR = 1.48$) and lower rates of occupational change ($B = -0.65, p < .000, OR = 0.52$).

[1] Following a reviewer comment, we tested for differences in VET satisfaction between occupational domains. The conducted analysis of variance revealed no significant differences, $F(7, 897) = 1.95, p = .06$).

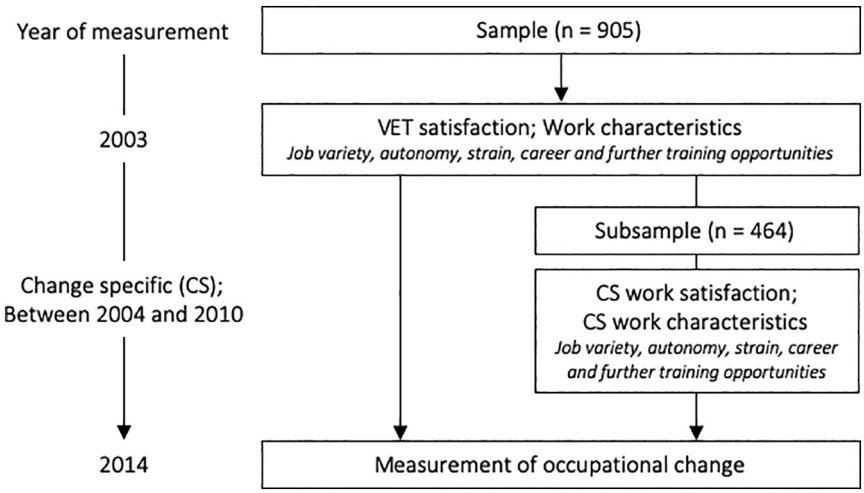

Fig. 1. Overview of samples, points of measurement and included measures. VET = Vocational training and education, CS = Change specific.

3.3. Measures

3.3.1. Work characteristics

Work characteristics, both during VET and in employment after VET, were measured on a five-point Likert-type scale ranging from *1 = never/rarely* to *5 = very often/always*, based on scales by Prümper et al. (1995) that were widely used in German-speaking surveys at the time of the initiation of the TREE panel study. Items were adapted in their wording to the VET specific context by TREE (2016a). *Job variety* was measured using a three item scale. A sample item is, "My tasks at work are diversified". *Autonomy* was measured with three items, a sample item is, "I can decide myself how I want to solve a task". *Strain* was measured using five items. A sample item is, "At work I am constantly pushed for time". *Opportunities for career development* were measured with the following two items, "My company offers professional development" and "My company offers career opportunities". The same work characteristics were measured during VET and in employment after graduation. Cronbach's alpha internal consistencies for all measures are reported in Table 1.

3.3.2. VET satisfaction

Satisfaction with the trained occupation (VET satisfaction) was measured with a four item scale developed by Neuenschwander (1998) and Neuenschwander et al. (2001). A sample item is, "I really like the work that my occupation contains". The four-point Likert-type scale ranged from *1 = not at all true* to *4 = exactly true*.

3.3.3. Work satisfaction

Work satisfaction was measured with the two items "I hope my work is going to stay as good as it is at the moment" and "After a day off, I am looking forward to go back to work", developed on the basis of Baillod (1992) and Bruggemann et al. (1975). The seven-point Likert-type scale ranged from *1 = hardly ever* to *7 = almost always*.

Occupational change. We operationalized occupational change as a change in the reported occupation in 2014, compared to the initially trained VET occupation, reported in 2003. The comparison is based on the Swiss Standard Classification of Occupations 2000 (SSCO 2000, Federal Statistical Office, 2014), which is equivalent to classification systems such as the International Standard Classification of Occupations (ISCO 08). The SSCO 2000 has four hierarchical levels (1–division, 2–class, 3–group, 4–type). To ensure that the depicted changes are meaningful in terms of occupational mobility that requires fundamentally new or additional training, occupational change was measured at the three-digit group level SSCO-code. There are 88 three-digit groups of occupations differentiating, for instance, occupations in agriculture from occupations in information technology or from care professions. If the three-digit SSCO code of the current occupation in 2014 differed from the three-digit SSCO code of the originally trained VET, the respective person was coded as having had an occupational change (= 1) vs. no change (= 0), in cases where the three-digit SSCO code was still the same.

Control variables. Because the results on gender differences in career mobility research have been ambiguous (Carless & Arnup, 2011), we included gender as a control variable in all analyses. We did not control for age and level of education as our sample is drawn from one age cohort and selected based on type of education. To account for person-related characteristics, we included generalized self-efficacy (GSE) as a control variable when testing the hypotheses predicting VET satisfaction and work satisfaction. GSE reflects a general belief of "one's fundamental ability to cope, perform, and be successful" (Judge & Bono, 2001, p. 80), and is positively related to work satisfaction (Judge & Bono, 2001). GSE was measured with four items based on scales by Schwarzer (1999), and Schwarzer and Jerusalem (1999). The items were measured on a four-point Likert-type scale ranging from *1 = not at all true* to *4 = exactly true*. A sample item is "I am confident that I could deal efficiently with unexpected events".

Table 1
Descriptive statistics and intercorrelations for all variables included in the model.

		M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13
1	VET satisfaction	3.18 (0.63)	(0.80)												
2	Job variety	3.96 (0.72)	0.50***	(0.85)											
3	Autonomy	3.44 (0.83)	0.20***	0.39***	(0.71)										
4	Strain	2.51 (0.59)	−0.07*	0.06	−0.11***	(0.64)									
5	Opportunities	2.67 (0.83)	0.26***	0.40***	0.22***	0.03	(0.79)								
6	GSE	3.06 (46)	0.12***	0.18***	0.13***	−0.04	0.13***	(0.77)							
7	CS Work satisfaction	4.17 (1.36)	0.25***	0.23***	0.09*	−0.04	0.18***	0.06	(0.71)						
8	CS Job variety	3.77 (0.77)	0.23***	0.36***	0.14**	0.04	0.23***	0.09	0.51***	(0.73)					
9	CS Autonomy	3.71 (0.82)	0.14**	0.19***	0.28***	−0.07	0.11*	0.09	0.41***	0.49***	(0.81)				
10	CS Strain	2.39 (0.56)	−0.08	−0.04	−0.04	0.29***	0.08	−0.03	−0.03	0.22***	0.05	(0.82)			
11	CS Opportunities	2.46 (0.82)	0.18***	0.13**	0.06	−0.04	0.31***	0.06	0.40***	0.38***	0.24***	0.05	(0.81)		
12	CS GSE	3.17 (0.42)	0.14**	0.09	0.06	0.03	0.07	0.47***	0.16***	0.11*	0.10*	−0.08	0.10*	(0.84)	
13	Gender	0.50	−0.05	−0.02	−0.10**	0.11***	0.04	0.16***	−0.05	0.05	−0.08	0.05	0.15**	0.17***	
14	Occupational change	0.60	−0.21***	−0.12**	−0.03	0.05	−0.07*	0.07*	−0.20***	−0.15**	−0.13**	0.12**	−0.07	−0.07	0.14**

Note. $N = 462$ for CS measures 6 to 10, and 902 for all other measures. VET satisfaction = satisfaction with trained occupation, Opportunities = opportunities for training and development, GSE = generalized self-efficacy, CS = change specific measurement wave. Gender was codes as female = 0, male = 1. Occupational change was coded as no change = 0, change = 1. Cronbach's alpha reliabilities are reported along the diagonal in parentheses.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

3.4. Data analysis

Hypothesis 1a was tested with a linear regression of work characteristics on VET satisfaction, measured at the end of VET in the year 2003. Accordingly, a second linear regression of work characteristics on work satisfaction, measured in participants' post graduate employment between 2004 and 2010, depending on the individual's year of occupational change, was computed for the testing of Hypothesis 2a. Using binary logistic regression, we examined in a longitudinal design whether VET satisfaction (Hypothesis 1b), and work satisfaction (Hypothesis 2b) were related to occupational change up to ten years after finishing VET. All analyses were calculated in SPSS 26. To test the hypothesis specifying the indirect effects (Hypotheses 1c and 2c), the conditional process modeling (PROCESS) program for SPSS (Hayes, 2013) was used. We used Model 4 of the PROCESS macro to test our hypotheses and conducted 10,000 bootstrap samples to examine the indirect effects of work characteristics on occupational change through VET satisfaction, and work satisfaction, respectively. This procedure allowed us to compute the coefficients for direct and indirect paths between work characteristics and occupational change, based on the recommendations of Preacher and Hayes (2008).

Gender was significantly correlated to the focal variable occupational change. Additionally, it was positively correlated with work characteristics, both in VET (autonomy and strain), and in later employment (career opportunities). While GSE measured during VET was positively correlated with occupational change, CS GSE was not. Hence, all results are reported including the two control variables.

4. Results

The descriptive statistics and correlations among all study variables are displayed in Table 1. Results show that all work characteristics are significantly related to both, VET satisfaction and work satisfaction, except for CS strain. Also, both types of satisfaction are negatively related to occupational change, which provides initial support for our hypotheses.

In Hypothesis 1a, we assumed a relation between positively evaluated work characteristics during VET and VET satisfaction. Results of the hierarchical linear regression are presented in Table 2. The overall model explained 27% of variance in VET satisfaction $F(6,895) = 55.07, p < .001$. After controlling for gender and GSE, job variety, strain, and opportunities for career development were significant predictors of VET satisfaction, whereas autonomy had no effect, thus, providing partial support for Hypothesis 1a.

The results from binary logistic regression used to test whether VET satisfaction (Hypothesis 1b) predicted occupational change are presented in Table 3. VET satisfaction emerged as a significant predictor in Model 2, $\chi^2(2, N = 902) = 63.87, p < .001$, the model successfully distinguished between stayers and changers, 62.9% of all participants were correctly classified. Thus, supporting our Hypothesis 1b, participants high in VET satisfaction were less likely to have changed their occupations ten years after finishing VET.

For testing Hypothesis 1c, stating that VET satisfaction would mediate between work characteristics experienced during VET and occupational change, the measures for work characteristics and VET satisfaction were taken from the end of VET (year 2003), and the dependent variable occupational change was measured in 2014. In the full sample (N = 902), the impact of most work characteristics on occupational change was mediated by VET satisfaction. We found a significant negative indirect effect for job variety, ab = −0.28, SE = 0.07, 95% CI [−0.42, −0.17], and career opportunities, ab = −0.04, SE = 0.02, 95% CI [−0.08, −0.01], whereas strain had a significant positive indirect effect on occupational change, ab = 0.07, SE = 0.03, 95% CI [0.02, 0.14]. There was no indirect effect for autonomy, ab = −0.01, SE = 0.02, 95% CI [−0.03, 0.05], which corresponded to the results from Hypothesis 1a, where autonomy was no significant predictor of VET satisfaction. Thus, Hypothesis 1c was partly supported.

In our subsample ($N = 462$), Hypothesis 2a tested whether work characteristics experienced in employment after VET were positively related to work satisfaction prior to occupational change. After controlling for gender and CS GSE, VET satisfaction was added to account for prior (dis-)satisfaction, and finally, CS work characteristics were introduced to the model. Overall, the model

Table 2
Linear regression analysis predicting VET satisfaction at the end of VET (full sample).

	Model 1			Model 2		
Predictor	B (SE)	β	t	B (SE)	β	t
Constant	2.69 (0.14)		19.18***	1.61 (0.17)		9.50***
Gender	–0.09 (0.04)	−0.04	−2.12*	−0.05 (0.04)	−0.04	−1.30
GSE	0.18 (0.05)	0.13	3.80***	0.04 (0.04)	0.03	0.90
Job variety				0.41 (0.03)	0.48	14.26***
Autonomy				−0.01 (0.02)	−0.02	−0.53
Strain				−0.11 (0.03)	−0.10	−3.51***
Opportunities				0.06 (0.02)	0.08	2.45*
Total R^2 (ΔR^2)	0.02 (0.02***)			0.27 (0.26***)		
F	8.39 (2, 899)***			55.07 (6, 895)***		

Note. $N = 902$. Variables were taken from 2003 of the TREE data set. GSE = Generalized self-efficacy, Opportunities = Opportunities for career development. VET satisfaction = Satisfaction with trained occupation. Gender was coded as female = 0, male = 1.

* $p < .05$.

*** $p < .001$.

Table 3
Summary of logistic regression analysis predicting occupational change (full sample).

Predictor	Model 1		Model 2	
	B (SE)	OR	B (SE)	OR
Constant	0.05 (0.09)	1.05	2.36 (0.41)***	10.56
Gender	0.70 (0.14)***	2.01	0.68 (0.14)***	1.98
VET satisfaction			–0.72 (0.12)***	0.49
Model $\chi 2$ (df)	26.03 (1)***		63.87 (2)***	
−2 log likelihood	1191.41		1153.57	
R^2 (Cox & Snell)	0.03		0.07	
R^2 (Nagelkerke)	0.04		0.09	

Note. $N = 902$. OR = odds ratio. Predictor variables were taken from 2003 of the TREE data set. Occupational change was measured in 2014. VET satisfaction = Satisfaction with trained occupation. Gender was coded as female = 0, male = 1.
*** $p < .001$.

explained 38% of variance in work satisfaction, $F(7,451) = 39.41$, $p < .001$. All work characteristics were significant predictors for work satisfaction, supporting Hypothesis 2a (Table 4).

Results of the logistic regression analysis testing the impact of work satisfaction during employment after VET on occupational change are presented in Table 5 (Hypothesis 2b). To test incremental effects of VET satisfaction, the variable was included after controlling for gender. The full Model 3, containing VET satisfaction, work satisfaction, and the control variable gender, was statistically significant, $\chi^2(3, N = 462) = 36.97$, $p < .001$, 61% of the participants were correctly classified. Supporting our Hypothesis 2b, participants high in VET satisfaction, and work satisfaction in later employment were less likely to change their occupations. Furthermore, VET satisfaction remained a significant predictor of occupational change also when work satisfaction as the more proximal predictor was included to the model, hence both constructs independently distinguished between stayers and changers.

To test Hypothesis 2c, assuming a mediating role of work satisfaction in the relation between work characteristics and occupational change, measures of both work characteristics and work satisfaction were taken from the change specific measurement wave. Significant negative indirect effects were found for CS job variety, $ab = -0.13$, $SE = 0.06$, 95% CI [−0.26, −0.01], CS career opportunities, $ab = -0.08$, $SE = 0.04$, 95% CI [−0.17, −0.01], and CS autonomy $ab = -0.05$, $SE = 0.03$, 95% CI [−0.12, −0.00]. CS strain had a significant positive indirect effect, $ab = 0.06$, $SE = 0.04$, 95% CI [0.01, 0.14], on occupational change, corresponding with the results from Hypothesis 1c. Work satisfaction mediated the relation between all work characteristics and occupational change, supporting our Hypothesis 2c. Additionally, CS strain had a significant direct effect on occupational change after taking other CS work characteristics into account: Higher reported CS strain predicted later occupational change, $c' = 0.52$, $SE = 0.18$, 95% CI [0.15, 0.88], $p = .005$.

5. Discussion

Recently, occupations have been introduced as stabilizing factors of contemporary careers (Dierdorff, 2019). Therefore, a focus on

Table 4
Linear regression analysis predicting work satisfaction in employment after VET (subsample).

Predictor	Model 1			Model 2			Model 3		
	B (SE)	β	t	B (SE)	β	t	B (SE)	β	t
Constant	2.44 (0.47)		5.14***	1.01 (0.55)		1.85	−0.73 (0.54)		−1.34
Gender	–0.22 (0.13)	−0.08	−1.68	–0.16 (0.13)	−0.06	−1.29	–0.25 (0.11)	−0.09	−2.35*
CS GSE	0.57 (0.15)	0.18	3.81***	0.46 (0.15)	0.14	3.09*	0.26 (0.12)	0.08	2.11*
VET satisfaction				0.54 (0.11)	0.23	4.97***	0.19 (0.09)	0.08	1.99*
CS Job variety							0.62 (0.08)	0.35	7.48***
CS Autonomy							0.27 (0.07)	0.16	3.72***
CS Strain							–0.28 (0.09)	–0.12	−3.01**
CS Opportunities							0.38 (0.07)	0.23	5.60***
Total R^2 (ΔR^2)	0.03 (0.03***)			0.08 (0.08***)			0.38 (0.30***)		
F	7.81 (2, 459)***			13.69 (3, 458)***			39.41 (7, 454)***		

Note. $N = 462$. Variables were taken from the wave before occupational change of the TREE data set. GSE = Generalized self-efficacy, VET satisfaction = Satisfaction with trained occupation, Opportunities = Opportunities for career development, CS = Change specific measurement wave. Gender was coded as female = 0, male = 1.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 5
Summary of logistic regression analysis predicting occupational change (subsample).

Predictor	Model 1		Model 2		Model 3	
	B (SE)	OR	B (SE)	OR	B (SE)	OR
Constant	−0.23 (0.12)	0.79	2.01 (0.60)**	7.43	2.65 (0.64)***	14.21
Gender	0.58 (0.19)**	1.79	0.56 (0.20)**	1.74	0.55 (0.20)**	1.74
VET satisfaction			–0.68 (0.18)***	0.51	–0.55 (0.18)**	0.58
CS Work satisfaction					–0.26 (0.08)***	0.77
Model $\chi 2$ (df)	9.22 (1)**		24.86 (2)***		36.97 (3)***	
−2 log likelihood	631.22		615.61		603.49	
R^2 (Cox & Snell)	0.02		0.05		0.08	
R^2 (Nagelkerke)	0.03		0.07		0.10	

Note. $N = 462$. *OR* = odds ratio. Predictor variables were taken from the wave before occupational change in the TREE data set. Occupational change was measured 2014. VET satisfaction = Satisfaction with trained occupation, CS = Change specific measurement wave. Gender was coded as female = 0, male = 1.

** $p < .01$.

*** $p < .001$.

occupational dynamics is gaining importance, also because today, many employees are more strongly committed to their occupation rather than to their employing organization (Anteby et al., 2016). This seems to be especially important in vocational careers, where individuals adopt occupation-specific roles, values and identities during VET. Our findings show that the work-related experience made during the formative phase of occupational identity development (Skorikov & Vondracek, 1998) has a long-term impact on career decisions, supplementing the empirically well-established influence of work satisfaction as an antecedent of job turnover. The current study does not only highlight the importance of VET satisfaction for the understanding of occupational change but also brings early occupation-specific work characteristics into focus.

As expected, we found that most work characteristics experienced during VET predict VET satisfaction, except for autonomy. In the context of the VET system, apprentices have to follow instructions and display specific occupation-related behavior (Borkowsky, 2000). Hence, as the training contexts requires learning and maneuvering within specific borders, autonomy may not be considered as an essential aspect of VET satisfaction. In line with our hypothesis, apprentices reporting high VET satisfaction were less likely to have changed their occupation ten years after graduation. Furthermore, VET satisfaction mediated the relation between work characteristics and occupational change. Previous research has provided extensive evidence for the influence of work design on individuals and organizations (Parker, 2014). Our findings contribute to this literature and add an occupational lens to the discussion.

Apprentices actively develop “shared patterns of thought and action” (Anteby et al., 2016, p. 191), and become socialized into their respective occupations throughout the formative phase of VET. It is also during this phase, where work design strongly impacts the development of the satisfaction with the occupation trained in, and consequently also the development of the individuals' occupational identity. Research has repeatedly reported the “functional importance” (Skorikov & Vondracek, 2011, p. 698) of occupational identity, linking it to numerous positive outcomes like psychological well-being, social adaptation, occupational success, and work satisfaction (Carson & Mowsesian, 1993). Occupational identity is formed “over time with varied experiences and meaningful feedback” (Ibarra, 2006, p. 3), as provided by the apprenticeship system and its early exposure to occupation-specific work characteristics. As a result, occupational identities are carefully formed as “relatively stable and enduring constellations of attributes, beliefs, values, motives, and experiences through which people define themselves in professional roles” (Ibarra, 2006, p. 3). In combining work design research with research on occupational turnover, our study provides evidence for the importance of work design for vocational career trajectories.

Our findings furthermore establish that both VET satisfaction and work satisfaction play an important role in understanding occupational change as both constructs distinguished between stayers and changers. Work satisfaction and VET satisfaction can be considered as two distinct constructs that individually contribute to a better understanding of occupational mobility in vocational careers. In participants' employment after graduation, all work characteristics, including autonomy, were confirmed as predictors of work satisfaction. Additionally, work satisfaction mediated the relation between work characteristics and occupational change, supporting our hypotheses and prior theoretical assumptions (Rhodes & Doering, 1983). The predictive power of work satisfaction on occupational change is not surprising and has been extensively established in previous research. More interestingly, we find that VET satisfaction predicts occupational change over a long period of time. This finding adds new insight to the discussion of career mobility, and also responds to a recent call to adopt an occupation-centric lens in theory and research (Dierdorff, 2019). A stronger focus on occupational influences also seems relevant when understanding VET in the context of vocational development. Future research should thus expand on the link between occupational identity, occupational commitment, and work design related predictors of occupational change. Also, macro-level labor market factors, such as job supply could be included to provide further information on the underlying processes for research and practice.

Strain emerged as a direct antecedent of occupational change in employment after graduation in our analysis. Major et al. (2013) report that occupational commitment in IT professionals is negatively predicted by job stress. Similarly, Blau (2007) found that work exhaustion predicts occupational change in medical technologists. Our findings correspond with these results and provide further evidence of the relation between strain and occupational change for a broad range of occupations. Furthermore, de Croon et al.

(2004) found that occupational change leads to a larger strain reduction compared to job change within the same occupational domain. According to these findings, high work-related psychological strain might have the power to directly impact occupational change and thereby reduce the perceived strain. Consequently, strain could be included as a focal predictor in future studies and theoretical models on occupational change.

5.1. Limitations

The main limitation of our study concerns attrition bias for the subsample. Nonrandom sampling was observed for some variables, directing towards staying in the trained occupation. Participants in the subsample were more likely to stay in their VET occupation and report higher VET satisfaction than those who had missing data for some waves and were thus excluded from the subsample. Our hypotheses were nevertheless supported, and occupational change was predicted by low VET and low work satisfaction, respectively. Because our results thus show that participants with low VET satisfaction were both more likely to change their occupation and to be excluded from the subsample, the remaining subsample provides a more conservative test of our hypotheses that lower VET and work satisfaction would predict leaving the occupation. Furthermore, our study is limited to a rather narrow set of work-related predictors and control variables for occupational change. Because we focused on the impact of VET satisfaction on occupational change, we did not consider how changes in work satisfaction over time relate to occupational change. It is possible that the impact of the formative VET satisfaction diminishes after longer employment periods and temporal changes in work satisfaction become more important. Additionally, our analysis revealed that GSE significantly predicted work satisfaction in employment after VET, although it was not a significant predictor for VET satisfaction. This finding suggests that person-specific traits become more important over time, when identity formation and development is further advanced (Sokol, 2009). Similarly, unexpected external events or career shocks such as losing one's job or receiving an unforeseen promotion (Akkermans et al., 2018), could also significantly impact individuals' career paths. Future studies should hence account for changes in work satisfaction over longer employment periods and include person-related traits as well as possible career shocks to develop a comprehensive understanding of the impact of formative experiences on occupational mobility.

Despite these limitations, this study contributes to a better understanding of occupational mobility in vocational careers. During the ten years considered, the private and professional lives of the participants undoubtedly underwent many changes. But still, early experience during VET remains important for understanding vocational career trajectories. Learning that work characteristics during VET, and specifically VET satisfaction have the power to explain such a far-reaching behavior as changing one's occupation up to ten years later informs practitioners on how undesired occupational mobility could possibly be reduced: By targeting and adjusting unfavorable work characteristics and promoting high quality work design already during VET, as well as in post graduate employment, undesired occupational mobility can be addressed.

6. Conclusion

To our knowledge, this is the first study to include work characteristics from VET as antecedents of VET satisfaction, and more importantly, to introduce VET satisfaction as a predictor of occupational change in a panel study design. Work design during the formative learning context of VET holds distinct long-term predictive power for occupational change, over and above satisfaction with employment after VET. Although also other relevant antecedents need to be taken into account, as introduced by different theoretical models and previous research findings, the impact of early occupational experiences, already during vocational preparation, needs to be considered in the turnover literature as well. Here lay the grass roots of occupational change in vocational careers.

CRediT authorship contribution statement

Guri Medici: Conceptualization, Methodology, Formal analysis, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration. **Cécile Tschopp:** Conceptualization, Methodology, Formal analysis, Data curation, Writing - original draft, Writing - review & editing, Supervision. **Gudela Grote:** Conceptualization, Methodology, Writing - original draft, Writing - review & editing, Supervision, Funding acquisition. **Andreas Hirschi:** Conceptualization, Writing - original draft, Writing - review & editing, Supervision, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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